

Options for Handling Selected Waste Streams within the RCRA Hazardous Waste Framework

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September 2002



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Options for Handling Selected Waste Streams: *INTRODUCTION*

• What does this *Guide* do?

This is an Internet-based guidance that functions as a “one-stop-shop” and portal to DOE and EPA *policy* and *interpretive* guidance, *Federal Register* notices, and regulations on handling the EH-selected types of hazardous waste streams under Subtitle C of the Resource Conservation and Recovery Act (RCRA). It does **not** elaborate on site-specific or technical (testing, engineering, design, or construction) aspects of waste management such as that issued by DOE’s **Office of Environmental Management (EM)** and its field elements.


By accessing resources through the *Guide*, users avoid receiving search results that often include documents offering limited guidance (e.g., acronym lists, meeting agendas, glossaries).

• How is this *Guide* organized?

Modules listed on the initial *Options for Handling Selected Waste Streams* web page identify the *Guide*’s content. The *Introduction* is followed by an initial module, “Radioactive and Non-Radioactive Batteries.” This module is comprised of *three* sections. The ***Background*** section presents a brief historical perspective. The ***Applicability*** section includes flowcharts and *Questions and Answers (Q&As)* that range from brief to detailed, in proportion to the amount of Internet-accessible DOE and EPA guidance that is available. That is, waste streams having extensive guidance use hyperlinks to and rely on posted guidance. Detailed *Q&As* are used for those lacking Internet-accessible information. The ***Module References*** section is in tabular format and is divided into *three* subsections: 1) “Regulations and Federal Registers”; 2) “DOE/EPA Guidance,” where entries are identified by agency and type of guidance, and are further separated into distinct categories based on their content; and 3) “Frequently Asked Questions (FAQs).” Entries appearing in these subsections were selectively chosen to support, and are directly accessible from, the module (*Q&As*) flowcharts. Users searching for guidance on a particular topic, however, can still view the same entries by simply scrolling to ***Module References*** section. Regardless of how they are accessed, entries serve as ***hyperlinks*** to electronic versions of the Internet-accessible DOE/EPA guidance.

Entries are organized in descending order, with those containing the most broadly applicable and/or recent guidance ***appearing first***.

can scroll through the *Background* and *Applicability* discussions that are grounded in existing RCRA program guidance and typically highlight “big-picture” items. Users searching for detailed guidance, however, should focus on the waste-specific flowcharts. Integrating site- and waste-specific knowledge, navigate through key decision points and actions, including those associated with using regulatory options, to select and/or verify RCRA-compliant treatment and/or disposition pathways and determine RCRA compliance responsibilities.

While navigating through a particular flowchart, users may require clarification of key terms, concepts, or requirements. In some instances, users can click on an Adobe Acrobat “Note” () to obtain additional clarification. More often, however, users can click on flowchart action- or decision-specific hyperlinks that directs them to topic-specific entries appearing in the ***Module References*** section. Examine these descriptive entries and, upon identifying the entry appearing most relevant to a particular question/issue, click on the blue italicized text to access an electronic version of the Internet-accessible EPA or DOE guidance in its entirety.

• How will the *Guide* help me?

Often Internet-based queries result in an extensive list of resources, many of which are only slightly relevant to a particular waste-specific issue or question. EH-413 has gone through the process of compiling, sorting through, culling, categorizing, and prioritizing existing DOE/EPA guidance. Thus, rather than scrolling through mounds of query-based information to identify relevant material, the *Guide* navigates users through the maze of regulatory and policy nuances governing cradle-to-grave management of the selected waste streams. It furnishes, directly (*Q&As*) or indirectly (using hyperlinks), detailed instructions and answers to waste-specific issues.

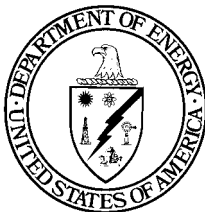
The *Guide* roadmap approach ***saves users time*** by effectively integrating detailed flowcharts with topic-specific, hyperlink entries (found in the *Module References* section). Users can jump from flowchart to entry to electronic guidance relevant to a given scenario in minutes.

• How will I know whether this *Guide* and its resources are current?

Users can regard the policies and guidance appearing in the *Guide* as current through the date of publication. Upon completing updates/additions, the modified version will be marked with the new date of publication, and new information will be identified using a “***NEW!***” icon.

How should I use this *Guide*?

Upon identifying a waste stream of interest, click on the corresponding icon. This will direct users to the relevant waste-specific discussion. Users seeking general information



Options for Handling Selected Waste Streams: ***RADIOACTIVE AND NON-RADIOACTIVE BATTERIES***

I. Background

Although batteries are prevalent throughout the DOE complex, they represent a relatively small portion of a DOE facility's waste streams. Nonetheless, issues associated with their treatment, storage, and disposal often pose unique challenges.

In January 1985 (50 FR 614; January 4, 1985), the U.S. Environmental Protection Agency (EPA) established a regulatory scheme under the Resource Conservation and Recovery Act (RCRA) by which spent batteries (sealed and unsealed lead-acid, nickel-cadmium [Ni-Cd], lithium, mercury, magnesium, etc.) were subject to hazardous waste regulations, *provided* they exhibit a characteristic of hazardous waste – ignitability, corrosivity, reactivity, or toxicity. It also offered reduced requirements for persons generating and/or storing (but *not* conducting reclamation of) lead-acid batteries destined for recycling and exempted batteries (*any type*) that were destined for regeneration.

In 1995, EPA published the final Universal Waste Rule [60 *Federal Register* (FR) 25492; May 11, 1995]. This rule codified, in part 273 of the 40 *Code of Federal Regulations* (CFR), a simplified set of requirements for hazardous waste batteries, which was designed to facilitate environmentally-sound collection and increase proper recycling or treatment. This rule also codified the following definition for “battery”:

“Battery” means a device consisting of one or more electrically connected electrochemical cells [anode, cathode, electrolyte, plus any electrical and mechanical connections] which is designed to receive, store, and deliver electric energy. This definition also includes unbroken batteries from which electrolyte has been removed. (40 CFR 273.6)

The *Mercury Containing and Rechargeable Battery Management Act* (P.L. 104-142) was signed into law on May 13, 1996. Although this Act did not amend RCRA directly, it made the universal waste rule effective in all 50 states. It required states who wish to regulate the collection, storage, and transportation of “subject” batteries (i.e., used rechargeable batteries, lead-acid batteries not reclaimed under Part 266, Subpart G,

certain mercury-containing batteries, and used consumer products containing rechargeable batteries that cannot be easily removed) to adopt provisions identical to those established in the federal Universal Waste rule.

The remaining discussion focuses on issues and key regulatory considerations associated with managing batteries. It uses [Flowcharts 1 and 2](#) to navigate through these issues and considerations and the related interpretive guidance.

II. Applicability

Q. *Why should I be concerned with waste batteries?*

A. One of the most common types of wastes found throughout the DOE complex are batteries such as:

- Ni-Cd batteries found in common items such as cellular and cordless/mobile phones, video cameras, portable power tools, and laptop computers;
- Small sealed lead-acid (SSLA) batteries in emergency lighting, security and alarm systems, computer backup devices, as well as phones, cameras, tools, and laptops;
- Unsealed lead acid batteries used in vehicles, emergency generators, and other equipment; and
- Alkaline batteries used in small appliances such as clocks and radios.

DOE personnel and contractors are legally responsible and can be held liable for the mismanagement of hazardous wastes, including waste batteries destined for disposal.

Q. *What Federal regulations govern waste batteries?*

A. Federal regulations that apply to batteries, including spent lead-acid batteries, have changed over time. Table 1 (next page) outlines and summarizes how RCRA Subtitle C requirements governing waste batteries have evolved.

Q. *How do I determine whether RCRA hazardous waste regulations govern my handling of batteries?*

A. Batteries being used or directly reused for their intended purpose do *not* meet EPA’s definition of solid waste and, therefore, *cannot* qualify as hazardous waste. Once a used battery is removed from service because it can no longer be used or directly reused without undergoing reclamation or significant processing, EPA presumes it is spent absent

Table 1. Evolution of RCRA Subtitle C Requirements Governing Hazardous Waste Batteries

Date	Regulation	Legal requirements
January 4, 1985	40 <i>CFR</i> 266.30 (subsequently changed to 40 <i>CFR</i> 266.80) 40 <i>CFR</i> 261.6(a)(3)(ii)	(1) Exempts from hazardous waste program the following persons managing spent lead-acid batteries that are <i>being reclaimed</i> : (a) Persons handling the batteries (i.e., lab technicians, remote power sources, DOE waste management personnel, retailers, wholesalers) other than the actual reclaimers; (b) Persons collecting batteries and/or storing batteries at intermediate facilities (i.e., collection facilities) before sending them to an off-site battery cracker (i.e., facility that recovers metal components by sawing off the top or by crushing the battery casings) or reclaimer; and (c) Transporters (2) Requires battery crackers or secondary lead smelters to manage spent lead-acid batteries as hazardous waste when storing the batteries before reclaiming them Exempts batteries, including lead-acid batteries, being returned to a battery manufacturer for regeneration and all entities/handlers from hazardous waste management requirements
May 11, 1995	Universal Waste Rule codified at 40 <i>CFR</i> Part 273	(1) Removed the provision (40 <i>CFR</i> 261.6(a)(3)(ii)) that exempted batteries from hazardous waste management requirements if they are to be regenerated (2) Non-lead acid batteries (except as provided in Public Law 104–142, entitled the “Mercury-Containing and Rechargeable Battery Management Act” below) may be managed in accordance with requirements in either (a) Universal Waste Rule (40 <i>CFR</i> Part 273) or (b) Full Subtitle C regulation (40 <i>CFR</i> Parts 260 through 272). (3) Spent lead-acid batteries may be managed according with requirements of either (a) Universal Waste Rule (40 <i>CFR</i> Part 273) or (b) Special requirements in 40 <i>CFR</i> 266 Subpart G.
May 13, 1996	<i>Mercury-Containing and Rechargeable Battery Mgt. Act</i> (PL 104–142)	(1) Requires that the collection, storage, and transportation of the following types of batteries be regulated under the May 11, 1995, Universal Waste Rule: (a) Used rechargeable batteries (b) Certain lead-acid batteries not managed under 40 <i>CFR</i> 266 Subpart G (c) Rechargeable alkaline batteries (d) Certain mercury-containing batteries banned from domestic sale (e) Used consumer products containing rechargeable batteries that are <i>not</i> easily removable (2) Stipulates that section 104(a) does not apply to any lead-acid battery that is managed in accordance with requirements in 40 <i>CFR</i> 266, Subpart G or equivalent requirements in an approved state program (Section 104(a)(2))
December 24, 1998	Universal Waste Rule codified at 40 <i>CFR</i> Part 273	Technical correction notice that creates no new regulatory requirements, but reinstates regulatory language that was mistakenly changed in a previous EPA rule, corrects certain regulatory provisions that apply to regenerating and storing lead-acid batteries, and clarifies existing regulatory requirements for lead-acid batteries

contrary documentation — even when the owner does not know whether the battery is reusable (EPA letter from Lowrance to Bergeson, Fox, Weinberg & Bennett, dated May 23, 1990). If, however, a device containing a battery (e.g., aids to navigation, laptop computer, calculator) is sent for repair, the battery is not viewed as being discarded until a decision to dispose of the device is made.

Batteries removed from service and classified as spent meet EPA’s definition of “solid waste.” As such, the battery(ies) must be characterized as nonhazardous or hazardous waste using testing or “waste knowledge”

such as battery labels, material safety data sheets [MSDSs], product specifications, or records from previous testing (62 *FR* 62081; November 20, 1997).

Non-hazardous batteries (e.g., alkalines manufactured after 1992) destined for recycling or disposal, scrap metal recovered from waste batteries (i.e., “processed scrap metal”), or spent lead-acid batteries that are regenerated are **not** subject RCRA’s hazardous waste cradle-to-grave management system. Waste batteries exhibiting the characteristics of ignitability, corrosivity, reactivity, or toxicity qualify as hazardous waste. In addition to being **corrosive** (i.e., aqueous and pH of less than or equal to 2 or

greater than or equal to 12.5), waste batteries qualify as hazardous if they (or one or more of their components) exhibit **reactive** characteristics such as:

- React violently, form potentially explosive mixtures, or generate toxic gases, vapors, or fumes when mixed with water
- Contain cyanide or sulfide and, when exposed to certain pH conditions, generate toxic gases or fumes
- Detonate or explode if subjected to a strong initiating source or if heated under confinement

The test for **toxicity** is the Toxicity Characteristic Leaching Procedure. TCLP testing of waste batteries, however, has long been an area of confusion, especially regarding particle size reduction and representative sampling. Briefly, when constituent concentrations in a liquid component or liquid extract (for samples taken from batteries or components containing greater than or equal to 0.5% solids) equal or exceed the TC metal thresholds

appearing in **Table 2** the waste is considered hazardous. As such, they must be managed as fully regulated hazardous waste or handled as universal waste as discussed below.

Table 2. Maximum Concentrations of Toxicity Characteristic Metals

EPA Code	Contaminant	Regulatory Level (mg/l)
D004	Arsenic	5.0
D005	Barium	100.0
D006	Cadmium	1.0
D007	Chromium	5.0
D008	Lead	5.0
D009	Mercury	0.2
D010	Selenium	1.0
D011	Silver	5.0

Q. How do conventional RCRA hazardous waste regulations affect my handling of waste batteries?

A. In general, sites generating less than 100 kilograms (kg) hazardous waste and one kg of acute hazardous waste (total) in any given month qualify as conditionally exempt small quantity generators (CESQGs).¹ CESQGs and their wastes are subject to significantly reduced RCRA requirements such as no prescribed accumulation standards or time limits, no manifesting requirements, and no obligation to transfer CESQG hazardous waste batteries to RCRA permitted or interim status facilities (40 CFR 261.5).

Large quantity generators (greater than 1000 kg hazardous waste or one kg of acute hazardous waste per month) and small quantity generators (100 - 1000 kg

hazardous waste per month) may accumulate and/or treat hazardous batteries on-site under 40 CFR part 262.

Accumulation or treatment, however, must occur in tanks, containers, or containment buildings compliant with 40 CFR 262.34 conditions (i.e., 90 or 180 day [in some cases 270 days] accumulation time limit) and unit-specific conditions. Under the satellite accumulation area provision, both LQGs and SQGs can accumulate indefinitely as much as 55 gallons of hazardous batteries in containers, provided accumulation occurs at or near the initial point of generation and remains under the control of the process operator (40 CFR 262.34(c)).

Unless they are transporting exempt lead-acid batteries or universal waste batteries (discussed below), LQGs and SQGs must manifest hazardous batteries to a “designated facility.” These include RCRA permitted and interim status treatment, storage, or disposal facilities; facilities that recycle hazardous batteries *without* storing them prior to recycling; and facilities reclaiming precious metals (40 CFR 260.10).

Q. Are there any options for handling hazardous waste batteries within the RCRA framework?

A. In 1995, batteries exhibiting one or more characteristics became eligible for a simplified set of regulations provided the state adopted the universal waste regulations (40 CFR part 273). In 1996, the *Mercury Containing and Rechargeable Battery Management Act* extended the availability of this optional regulatory program to entities collecting, storing, and transporting subject battery types in **all** 50 states, including:

- used rechargeable batteries,
- lead-acid batteries *not* being reclaimed under 40 CFR part 266, Subpart G,
- certain mercury-containing batteries, and
- used consumer products containing rechargeable batteries that cannot be easily removed.

Thus, personnel at any DOE site may choose to use the alternative universal waste regulations for these battery types. Under these regulations, entities that generate, accumulate, or consolidate but do not treat,² recycle, or dispose of universal waste batteries qualify as large or small quantity handlers of universal wastes (LQHUs or SQHUs) depending on whether the handler accumulates **at any time** more than 5,000 kilograms (kg) total universal wastes (batteries, pesticides, thermostats, and lamps calculated collectively). Sites that exceed the 5,000 kg threshold must comply with LQHU regulations for the remainder of that calendar year, including:

¹ Sites should **not** count batteries *managed under part 273* toward their monthly hazardous waste quantities when determining their generator status (40 CFR 261.5(c)(6)).

² Several battery-related activities that might otherwise qualify as treatment triggering destination facility standards (e.g., removing electrolyte from batteries; disassembling battery packs into individual batteries or cells) may be conducted by handlers provided the battery or cell casings remain closed and intact.

- Prohibitions on treatment other than those outlined in the battery waste management activities section,
- Labeling and marking of each battery or container holding batteries with “Universal Waste-Battery(ies)”; “Waste Battery(ies)”; or “Used Battery(ies)”; and
- Accumulation standards that do *not* limit the types of storage units, but limit accumulation beyond one year to situations that accumulation is solely to facilitate proper recovery, treatment, or disposal.

Universal waste regulations must be observed beginning on the date used batteries are permanently removed from service for discard or processing. For unused batteries, the point of generation begins the date a handler decides to discard them.

Q. *Have there been any other developments that affect how waste batteries are managed?*

A. In addition to the regulatory developments outlined in Table 1, EPA’s land disposal restrictions (LDR) program (40 CFR part 268) has dramatically impacted the handling of batteries. Under the LDR program, land disposal of hazardous wastes is banned until each prohibited waste is treated to meet the standards specified in 40 CFR 268.40, table “Treatment Standards for Hazardous Wastes.” LDR treatment standards are expressed in one or a combination of the following formats:

- Constituent concentration levels (i.e., maximum allowable concentrations for hazardous constituents, either in the waste (mg/kg), or in an extract derived from the treated waste (mg/l TCLP),
- Specified method of treatment (i.e., a single specified method, a group of specified methods, or several alternative specified methods)

LDR treatment standards expressed in the form of constituent concentration levels may be met using any available technology or combination of technologies, as long as prohibited dilution does not occur. In contrast, LDR treatment standards expressed as a specified method of treatment can only be met using the method specified, unless a variance is obtained.

The most common types of waste batteries fall within waste-code subcategories prescribing a specified method of treatment. These include:

- D006 Cadmium Containing Batteries Subcategory – RTHRM (thermal recovery of metals or inorganics in an industrial furnace),
- D008 Lead-Acid Batteries Subcategory – RLEAD

- (thermal recovery of lead in secondary lead smelters),³ and
- Mercury-containing batteries (D009 High-Mercury Inorganic Subcategory when they contain at least 260 mg/kg mercury) – RMERC (roasting or retorting).

LDR obligations (e.g., identifying all applicable treatment standards, complying with the storage prohibition) are fully applicable to hazardous waste generators and conventional treatment, storage, and disposal (TSD) facilities managing hazardous waste batteries. Similarly, facilities that treat, recycle, or dispose of universal waste batteries (i.e., destination facilities) are fully subject to LDR. Handlers collecting, storing, or transporting universal waste batteries, however, are explicitly exempt from 40 CFR 268.7 (LDR “testing, tracking, and recordkeeping requirements”) and 268.50 (“Prohibitions on storage of restricted wastes) provided they comply with 40 CFR part 273 provisions (40 CFR 268.1(f)).

Batteries that fall within a waste code or waste code subcategory for which the LDT treatment standard is a specified technology **must** be treated using that specified method, unless a variance is obtained.

Q. *What constitutes “recycling” and what recycling options exist for waste batteries?*

A. DOE’s *Pollution Prevention Strategy* and its 1996 *Pollution Prevention Program Plan* (DOE/S-0118) direct its sites to integrate pollution prevention into their activities. Consistent with ISO 14001, in DOE’s view pollution prevention incorporates waste minimization, which includes recycling.

Batteries are “recycled” if they are used, reused, or reclaimed. Materials are “used or reused” when they are **directly** used as either ingredients or effective substitutes for a commercial product (provided use/reuse is consistent with its intended purpose). Materials are “reclaimed” if they are processed to recover useable products or if they are regenerated (40 CFR 261.1). To facilitate recycling, some distributors, retailers, businesses, and public agencies have instituted “take-back” programs for spent batteries. Also, programs for the recycling of commercial batteries are being established with the support of groups such as the Battery Council International, the Portable Rechargeable Battery Association, and the Rechargeable Battery Recycling Corporation (RBRC). For example, RBRC, a nonprofit organization representing rechargeable battery manufacturers, developed

³ EPA has determined the appropriate waste code subcategory for drained, radioactively contaminated lead-acid batteries should be the D008 Radioactive Lead Solids Subcategory – MACRO (macroencapsulation as defined at 40 CFR 268.42(a) Table 1) [letter from Cotsworth (EPA) to Lawrence (DOE) dated August 9, 2001].

the **Charge Up to Recycle!** program at www.rbrc.com or 1-800-8-BATTERY. This program offers various recycling plans, with RBRC paying or sharing the cost of consolidating the batteries, shipping them to the processing facility, and recycling them.

Q. How should I determine whether and which RCRA provisions and handling options apply to my batteries?

A. Upon determining that a used or unused battery cannot be used, the person discarding the battery must determine: (1) whether it (or any of its components) are eligible for an exemption or exclusion, (2) whether it qualifies as solid waste, (3) whether it qualifies as hazardous waste, and (4) the applicable regulatory framework. For hazardous waste batteries, the last of these should be determined based on whether a state has adopted the universal waste rule or the waste battery falls under the *Battery Management Act* umbrella (i.e. its collection/storage is governed by the universal waste rule regardless of state authorization status). If the state has *not* adopted and it is *not* one of the four battery types subject to the *Battery Management Act* the hazardous battery is ineligible for the optional universal waste program and the person is a hazardous waste generator.

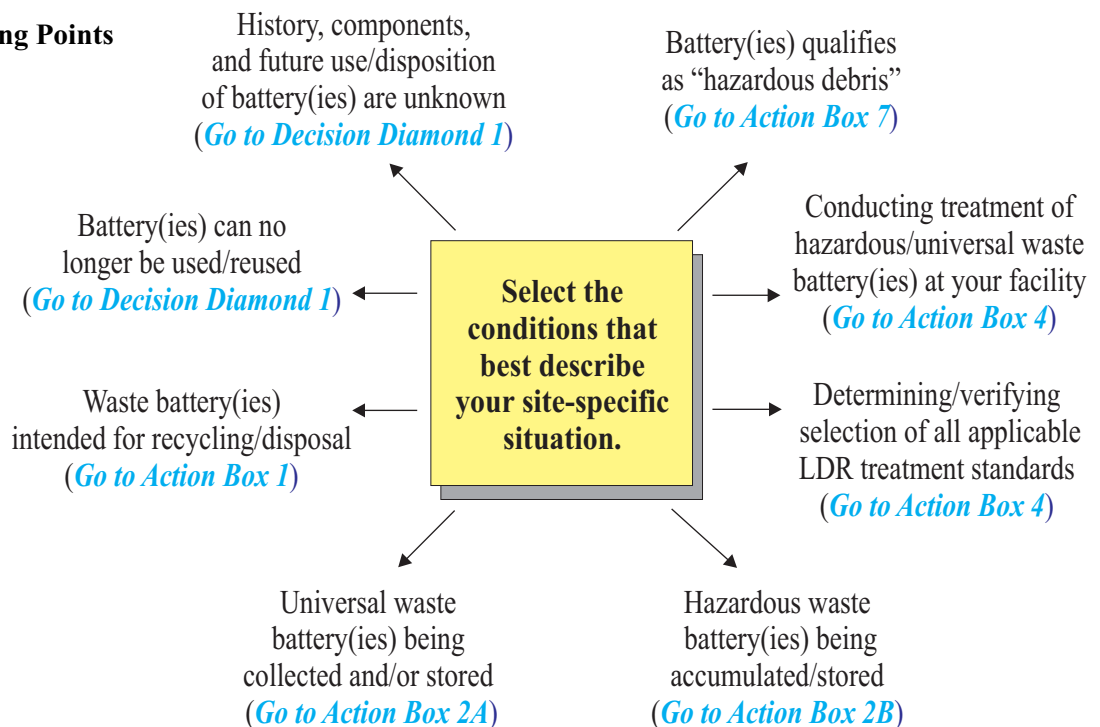
For purposes of identifying, selecting, and/or verifying the use of LDR compliant treatment technologies hazardous waste generators and universal waste destination facility owners/operators must determine *all* of the waste code and subcategory-specific LDR

requirements that apply. **Flowcharts 1 and 2** (next pages) walk through all of the preceding determinations and other RCRA cradle-to-grave nuances and responsibilities.

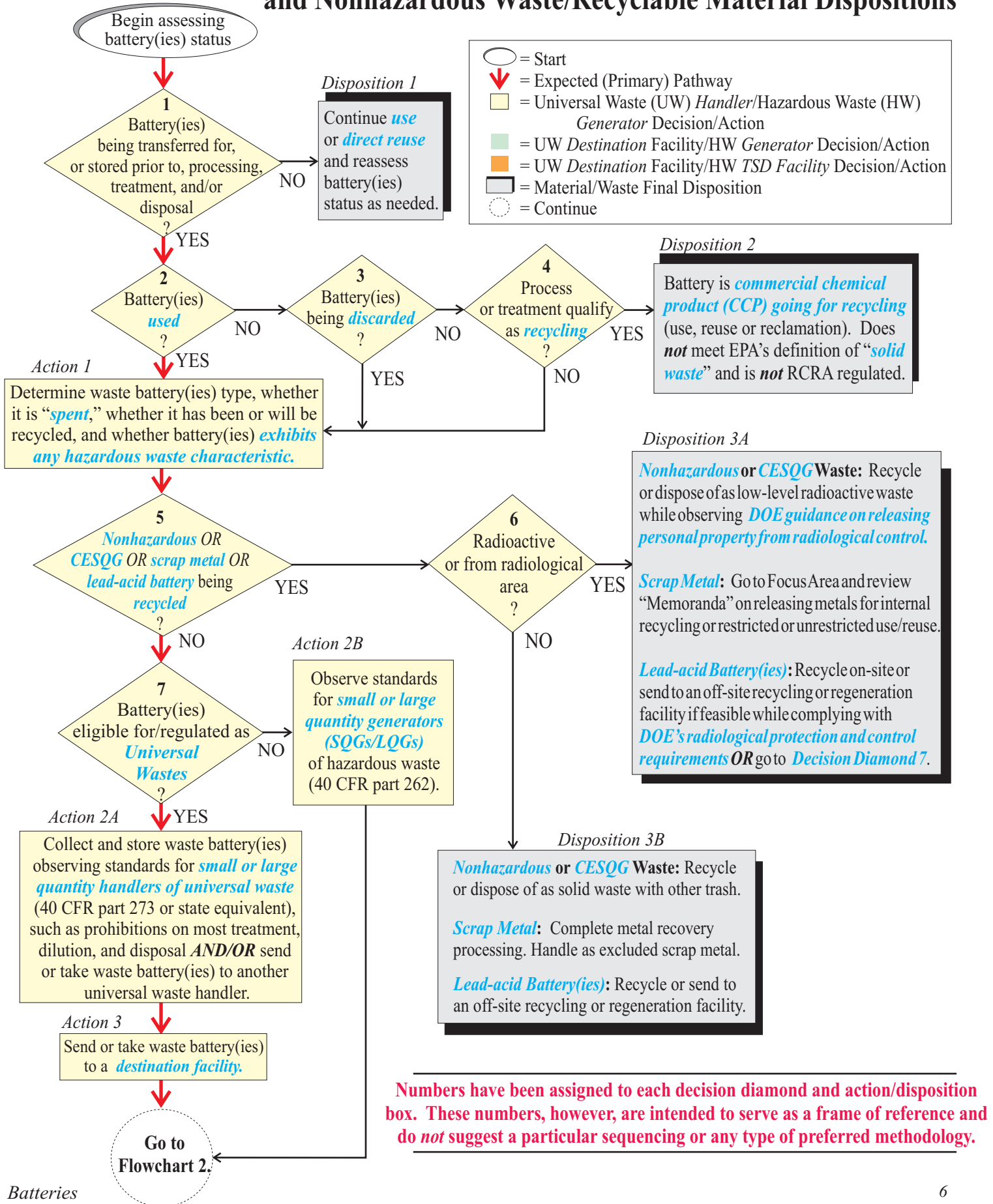
Before getting started, users of this guidance should consider their site-specific situation and obligations. In some cases, responsibilities associated with a battery or group of batteries may be limited to storing the battery(ies) in an OSHA-compliant manner until another end user can be identified and the battery(ies) is transferred for reuse. In other instances, battery handling responsibilities may involve completing a Waste Disposal Requisition and transferring possession of the battery(ies) to waste management personnel. On occasion, users may be tasked with collecting, characterizing, accumulating in a RCRA-compliant manner, and identifying the appropriate disposition pathway(s) for hundreds of battery types from numerous battery users that are located throughout an extensive multi-building research complex. Finally, some persons may be entrusted with avoiding or reducing long-term enforcement vulnerabilities or cleanup obligations and, therefore, must verify that all applicable waste treatment technologies were identified and applied, treatment residuals are properly accounted for, and the preferred/selected disposal site is compliant with RCRA regulatory obligations.

To get started, users should gather any battery(ies)-related information and either start at the beginning of Flowchart 1 or determine an appropriate starting point. Figure 1 illustrates several optional starting points and is designed to streamline the use of the flowcharts. Users recognizing that a description below reflects their site-specific conditions should click on the link to begin viewing the flowcharts at the most appropriate decision diamond or action box.

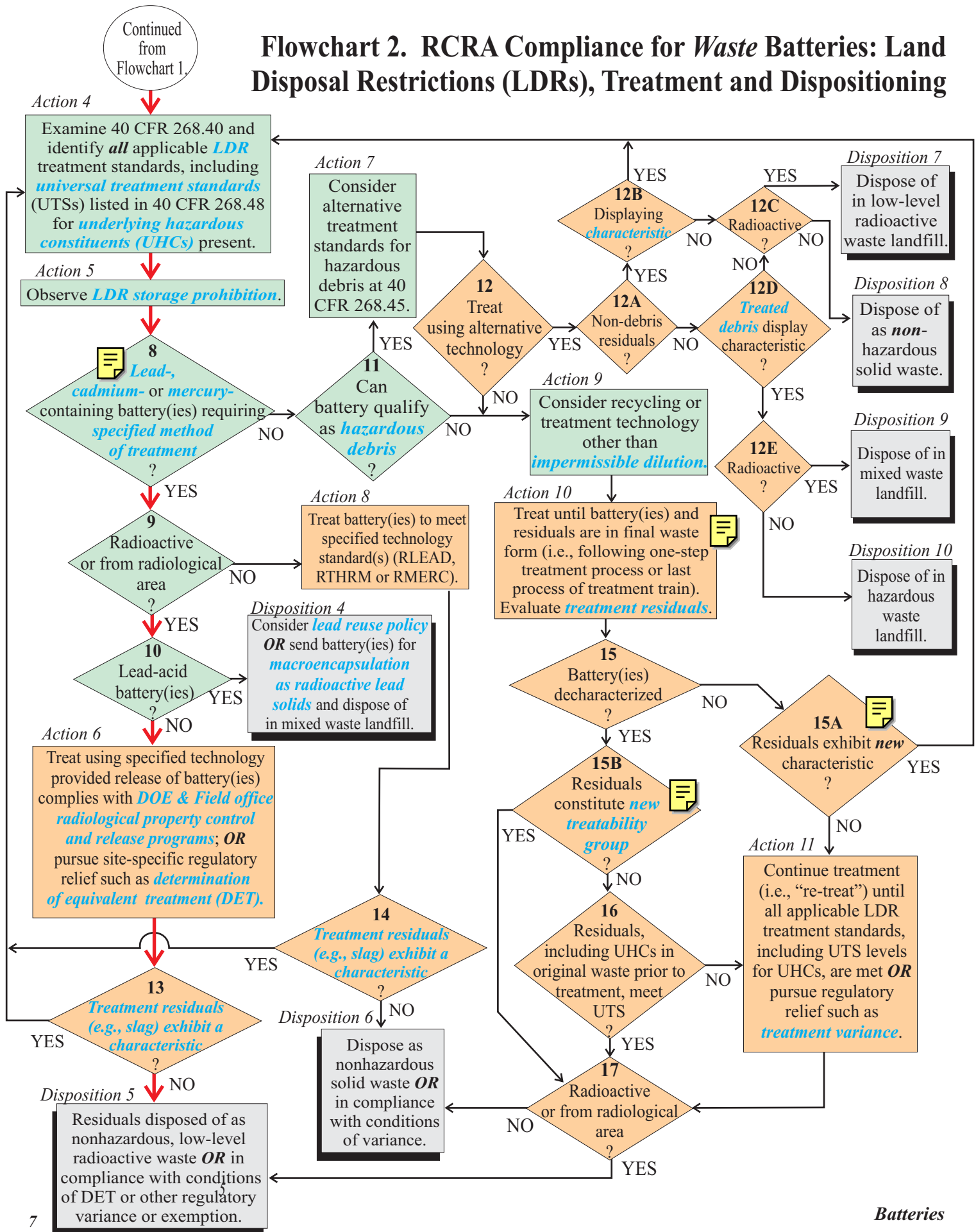
Figure 1. Flowchart Starting Points



Flowchart 1. RCRA Compliance for Batteries: Waste Characterization, Handling and Nonhazardous Waste/Recyclable Material Dispositions



Flowchart 2. RCRA Compliance for *Waste Batteries: Land Disposal Restrictions (LDRs), Treatment and Dispositioning*



III. Module References L (Click on the description(s) of interest to view/access the module reference online) 7

A. REGULATIONS AND *FEDERAL REGISTERS*:

Regulations: *40 Code of Federal Regulations (CFR) Part 273; 261.6(a)(2)(iv); Part 266, Subpart G; 268.40.*

Federal Register: *Universal Waste Rule (Hazardous Waste Management System; Modification of the Hazardous Waste Recycling Regulatory Program); Final Rule; correcting amendments (63 FR 71225; December 24, 1998) – Available through Federal Register Online via GPO Access at http://www.access.gpo.gov/su_docs/aces/aces140.html.*

Universal Waste Rule (Hazardous Waste Management System; Modification of the Hazardous Waste Recycling Regulatory Program); Final Rule (60 FR 25491; May 11, 1995) at www.epa.gov/docs/fedrgstr/EPA-WASTE/1995/May/Day-11/pr-223.html.

Land Disposal Restrictions Phase IV: Treatment Standards for Wood Preserving Wastes, Paperwork Reduction and Streamlining, Exemptions From RCRA for Certain Processed Materials; and Miscellaneous Hazardous Waste Provisions; Final Rule (62 FR 25997-26040; May 12, 1997) at www.epa.gov/fedrgstr/EPA-WASTE/1997/May/Day-12/f11636.htm.

Land Disposal Restrictions Phase IV: Treatment Standards for Wood Preserving Wastes, and Treatment Standards for Metal Wastes, and Zinc Micronutrient Fertilizers, and Carbamate Treatment Standards, and K088 Treatment Standards, Final Rule; technical correction (64 FR 25407; May 11, 1999) at www.epa.gov/fedrgstr/EPA-WASTE/1999/May/Day-11/f11271.htm.

Characteristic Slags Generated From Thermal Recovery of Lead by Secondary Lead Smelters; Land Disposal Restrictions; Final Rule; Extension of Compliance Date, (63 FR 48124; September 9, 1998) at www.epa.gov/fedrgstr/EPA-WASTE/1998/September/Day-09/f24045.htm.

Hazardous Waste Management System; Definition of Solid Waste; Final Rule (50 FR 614; January 4, 1985) – Unavailable Electronically.

Entries appear in descending order, with resources containing the most broadly applicable and/or most recently issued interpretive guidance **appearing first**.

B. DOE/EPA GUIDANCE:

1. DEFINITION OF SOLID WASTE

(Click on description(s) to view/access an entry online)

General	Recycling	Direct Reuse	Commercial Chemical Products (CCPs)	Discarded / Spent	Scrap Metal
<i>RCRA Definition of Solid Waste EPA-T</i>	<i>Organizing Battery Recycling Plans (Pollution Prevention Opportunity) EPA-G</i>	<i>Remove from One Site for Continued Use Without Being Refortified EPA-L</i>	<i>Definition of CCPs and Status of Non-listed CCPs EPA-L</i>	<i>RCRA Applicability to CCPs Eventually Discarded EPA-L</i>	<i>Exclusion for/Definitions of Scrap Metal (62 FR 26011)</i>
<i>Environmental Mgt. Guide for Small Lab EPA-G</i>	<i>Definition of Solid Waste and HW Recycling EPA-T</i>	<i>Purchase of Used Lead-acid Batteries EPA-L</i>	<i>Distinction Between Used, Unused, and</i>	<i>“Spent” as Result of Contamination and/or Nonfunctional EPA-L</i>	<i>EH-41 Focus Area: DOE Directives Development Initiative for the Mgt. and Release of Surplus Material</i>
(Cont. Next Page)	(Cont. Next Page)	(Cont. Next Page)	(Cont. Next Page)	(Cont. Next Page)	(Cont. Next Page.)

Batteries

DOE-D = Data DOE-G=Guidance DOE-IB=Information Brief DOE-L=Letter DOE-M=Memorandum DOE-P=Position Paper DOE-RB=Regulatory Bulletin
 EPA-G=Guidance EPA-L=Letter EPA-M=Memorandum EPA-MRQ=Monthly Report Question EPA-R=Report EPA-T=Training FR=Federal Register

General (Cont.)	Recycling (Cont.)	Direct Reuse (Cont.)	CCPs (Cont.)	Discarded / Spent (Cont.)	Scrap Metal (Cont.)
<p><i>Point of Generation & Mgt. Issues for Batteries at Remote Locations EPA-L</i></p> <p><i>Point of Generation & Satellite Accumulation of Batteries at Remote Locations EPA-M</i></p> <p><i>Variance for Lead Plates and Groups EPA-M</i></p> <p><i>Universal Waste Q&As #8a EPA-M</i></p> <p><i>Disposal of Potassium Hydroxide Electrolyte in Sanitary Sewer EPA-L</i></p>	<p><i>Regulatory Status of ALL Waste Streams from Recycling of Lead-acid Batteries EPA-L</i></p> <p><i>Recycling Non-listed CCPs; Burden of Proof EPA-L</i></p> <p><i>Regeneration vs Reclamation for Spent Lead-Acid Batteries EPA-MRQ</i></p> <p><i>Partially Reclaimed Ni-Cd Batteries EPA-L</i></p> <p><i>Regulation/Manifesting of Lead Sulfate-coated, Lead-acid Battery Plates EPA-L May 30,97</i></p> <p><i>DOE Policy on Reuse and Recycling of Scrap Metals</i></p>	<p><i>Distinction Between Used, Unused, and Partially Reclaimed Ni-Cd Batteries EPA-L</i></p>	<p><i>Partially Reclaimed Ni-Cd Batteries EPA-L</i></p> <p><i>Product Returned to Manufacturer or Wholesaler EPA-L</i></p> <p><i>Unused Off-Spec Lead Plates Used in Production EPA-L</i></p>	<p><i>Spent when Removed for Processing Even When Functioning Effectively EPA-L</i></p> <p><i>Status of ALL Materials from Spent Lead-acid Battery Reclamation EPA-L</i></p> <p><i>Spent Lead-acid Batteries Stored Before Reclamation NOT Subject to Speculative Accumulation EPA-L</i></p> <p><i>Battery Chips from Lead-acid Battery Reclamation are Spent EPA-L</i></p>	<p><i>Radiation Protection Using Authorized Limits for Release DOE-O</i></p> <p><i>Control & Release of Property with Residual Rad DOE-G</i></p> <p><i>DOE Programmatic Env. Impact Statement (EIS) on Scrap Metals DOE-EIS</i></p> <p><i>Misc. Alkaline Battery Metal Values (with Oily Film) versus Plates Mixed with Lead Oxide Sludge EPA-L</i></p> <p><i>Batteries with “Significant Liquid Component” NOT Scrap Metal (50 FR 624) Unavailable Electronically</i></p> <p><i>Status of Each Metal-bearing Component from Recycling Lead-acid Batteries EPA-L</i></p> <p><i>Steel Industrial Battery Cases versus Mixtures Sent for Reclamation EPA-L</i></p> <p><i>Ni/Cd Batteries as Scrap Metal when Recycled EPA-MRQ</i></p> <p><i>Circuit Boards with Minimal Battery Components are Scrap Metal EPA-L</i></p>
		<p>Some discussion(s) presented in an EPA memorandum/letter may be outdated since they preceded significant final rules (e.g., the universal waste rule, LDR Phases, toxicity characteristic). These resources, however, have been <i>selectively chosen</i> because their concepts/topics continue applying to batteries being managed under the conventional hazardous waste program or the universal waste rule.</p>			

2. DEFINITION OF HAZARDOUS WASTE					
(Click on description(s) to view/access an entry online)					
General	Lead-acid (Small sealed & Unsealed)	Cadmium-containing	Mercury-containing	Lithium	Miscellaneous
“Hazardous” Terminology DOE-IB Hazardous Waste Definition EPA-T Overview of the Identification of HW Under RCRA DOE-IB Questions and Answers on the RCRA Toxicity Characteristic Rule; DOE-IB Ignitable, Corrosive, Reactive, and Incompatible Wastes DOE-IB Waste Analysis Plans at HW Generator and TSD Facilities EPA-G General Program & Characterization Data (Dry Cell Batteries) EPA-G (Use Pub. No. 530K92006 to Find) Environmental Mgt. Guide for Small Labs, (Section 3.3) EPA-G	Universal Waste Rule: Technical Amendments DOE-RB Regulation/Manifests for Lead Sulfate-coated Battery Plates EPA-L Regeneration Versus Reclamation EPA-MRQ Plastic Chips from Reclamation EPA-L Steel Industrial Battery Cases versus Mixtures Sent for Reclamation EPA-L Stored Before Reclaiming NOT Subject to Speculative Accumulation EPA-L Regulation of Storage Areas Prior to Recycling EPA-L Drained, Radioactively Contaminated Lead Acid Batteries EPA-L, DOE-L&D	Three Types Subject to Specified LDR Standard Do NOT Include Zinc-carbon EPA-L Treatment and Disposal of 6 Volt Mercury-Cadmium Batteries EPA-L Historical Characterization Data for Cadmium in Dry Cell Batteries EPA-G (Use Pub. No. 530K92006 to Find Publication) Status of Unused, Used, and Partially Reclaimed Ni/Cd Batteries EPA-L Ni/Cd Batteries as Scrap Metal when Recycled, EPA-MRQ Disposal of Potassium Hydroxide Electrolyte from Ni-Cd Batteries EPA-L	Characterization of Dry Cell Batteries Containing Mercury EPA-L Historical Characterization Data for Mercury in Dry Cell Batteries EPA-G (Use Pub. No. 530K92006 to Find Publication) Mercury Batteries are Containers, NOT Debris EPA-L Mercury Sludge in Battery Carcass NOT Debris EPA-L Deteriorated Mercury ATON Batteries ARE Debris EPA-L Regulations, Quantities of, & Innovative Technologies for 6-Volt Mercury-Cadmium Batteries EPA-L	Reaffirms Status of Lithium Sulfur Dioxide Batteries EPA-L Characterization of Fully Discharged Lithium/Sulfur Dioxide Batteries EPA-L Characterization & Scope of Lithium Sulfur Dioxide Batteries EPA-L Make Determination for Lithium Thionyl Chloride Batteries EPA-L	Guidance on Testing Requirements for Mixed (Radioactive and Hazardous) Waste DOE-M Applicability to/Mixtures of Universal & Hazardous Wastes Q&As#8,16 EPA-M Intermediates from Battery Reclamation Not Derived-from; Must Exhibit Characteristic EPA-L Management of Silver-containing Batteries and Residues from Burning EPA-L SAFT Gelled Electrolyte Batteries EPA-L Spent Lead-Acid Batteries & Counting Requirements EPA-MRQ Entire Battery Counted in Weight Calculations EPA-M Disposal of Spent Electrolyte EPA-L TCLP Sample Prep of Dry Cell Batteries EPA-L

Entries appear in descending order, with resources containing the most broadly applicable and/or most recently issued interpretive guidance **appearing first**.

Batteries

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3. LAND DISPOSAL RESTRICTIONS (LDRS) (Click on description(s) to view/access the resource online)					
General	"Hazardous Debris"	Batteries with Specified Technologies	Treatment Residues	Relationship to Universal Waste	Miscellaneous
LDR Summary of Requirements EPA-G	Battery Carcasses are Containers, NOT Debris, and Subject to More Specific Battery Standards EPA-L	Drained, Radioactively Contaminated Lead Acid Batteries EPA-L, DOE-L, DOE-D	Treatment Residuals & Point of Generation (64 FR 25411)	Universal Waste Q&As #7 EPA-M	Waste Management and LDR Storage Prohibition DOE-IB
Introduction to LDR EPA-T	Deteriorated Mercury Batteries ARE Eligible for Debris Standards EPA-L	Three Types of Cadmium-containing Batteries Subject to Specified Cadmium Battery Standard do NOT Include Zinc-carbon EPA-L	LDR Summary of Requirements (see Sec 3.6,1 and 8.2) EPA-G		Lead-acid Battery Meets All LDR Storage Prohibition Conditions EPA-L
LDR Program Overview DOE-G	Mercury Sludge in Battery Carcass NOT Debris EPA-L	Treatment/Disposal of 6-Volt Mercury-Cadmium Batteries EPA-L	Residues from Using Specified Technology ("RLEAD") Subject to HW Determination (63 FR 28565-6)		LDR Treatment Variances (62 FR 64503)
LDR Glossary EPA Web page	Status of Broken/Ruptured Containers EPA-L	Applicability of Two Definitions Of Macroencapsulation for Rad Haz Debris EPA-M	Residuals from Lead Recovery Subject to HW Determination (pp. 3-8; 10-16; 21-23) EPA-G		Brookhaven Determination of Equivalent Treatment EPA-L
	Debris Constituents Subject to Treatment EPA-L	MACRO as Specified Technology (D008 Rad Lead Solids) vs. Macroencapsulation for Hazardous Debris EPA-L	Residuals from Lead Recovery Subject to HW Determination EPA-L		Clarification of LDR Dilution Prohibition and Combustion of Inorganic Metal-Bearing HWs EPA-M
	Recombined Shredder Residue Still Debris EPA-L	No TCLP Analysis Required for Rad Lead Solids That Undergo MACRO EPA-L	Characteristic Slags Generated From Thermal Recovery of Lead ("RLEAD") (63 FR 48124)		Clarification of Phase IV (TC Metals) Effective Dates EPA-M
	Use Visual Inspections to Determine Whether Mixture is Debris EPA-L		Residues from Burning Silver-containing Batteries EPA-L		
	Macroencapsulation EPA-L				
	Disposal of Characteristic Debris That No Longer Displays Characteristic In Subtitle D Unit EPA-L				
	Disposal of Immobilized Debris in HW vs. Subtitle D Landfill EPA-MRQ				
Some discussion(s) presented in an EPA memorandum/letter may be outdated since they preceded significant final rules (e.g., the universal waste rule, LDR Phases, toxicity characteristic). These resources, however, have been selectively chosen because their concepts/topics continue applying to batteries being managed under the conventional hazardous waste program or the universal waste rule.					

4. HANDLING UNIVERSAL/HAZARDOUS WASTES					
(Click on description(s) to view/access the resource online)					
General	Lead-acid Batteries	Handlers of UW	Generators of HW	Destination/TSD Facilities	State Authority
Intro to Universal Waste EPA-T	Universal Waste Rule: Technical Amendments DOE-RB	Universal Waste Rule: Final Rule Issued DOE-RB	HW Generator Requirements DOE-IB	Permitting Guide for Hazardous & Mixed Waste Mgt Facilities DOE-G	Universal Waste Q&As #1-6, 21 EPA-M
Intro to Generators EPA-T	Lead-Acid Batteries & Universal Waste EPA-MRQ	Universal Waste Q&As #9, 11, 13, 17-20, 22 EPA-M	Requirements for Satellite Accumulation Areas DOE-IB	Intro to Permits and Interim Status EPA-T	Implementation of the Mercury-Containing and Rechargeable Battery Mgt..Act EPA-G
Universal Waste Rule: Final Rule Issued DOE-RB	Implementation of the Mercury-Containing and Rechargeable Battery Mgt. Act EPA-G	Regulation of Storage Areas Used Prior to Recycling EPA-L	Transportation of RCRA HW DOE-IB	Universal Waste Q&As #7, 12, 13, 22 EPA-M	Enforcement and State-only Universal Wastes EPA-M
Universal Waste EPA web page	Regulations Applicable to Storage Areas EPA-L	Battery Mgt. Activities in Containment Buildings EPA-MRQ	Manifest Requirements DOE-IB	Battery Mgt. Activities in Containment Buildings EPA-MRQ	Removal of Electrolyte Allowed under Federal Preemption EPA-L
Implementation of the Mercury-Containing and Rechargeable Battery Mgt. Act EPA-G	Removal of Electrolyte NOT Eligible for Federal Preemption EPA-L	Removal of Electrolyte EPA-L	Satellite Accumulation Area Provision for Used Ni-Cd Batteries EPA-L	Regulations for Lead-acid Battery Storage Area Activities Prior to Recycling EPA-L	Mercury-Containing & Rechargeable Battery Mgt. Act EPA-M
Universal Waste Q&As #8, 11, 16, 18 EPA-M	Scope of Regeneration Exemption (Pre-UW) EPA-L	Labeling Shrink-wrapped Pallet as "Portable Device" EPA=L	Regulations Applicable to Lead-acid Battery Storage Areas EPA-L	Neutralization Unit Fully Regulated if Acid is Corrosive and Toxic EPA-L	
FAQs on the Universal Waste Regs EPA-MRQ		Disposal of Potassium Hydroxide Electrolyte in Sanitary Sewer EPA-L	Point of Generation & Mgt. Issues for Batteries at Remote Locations EPA-L		
		30-day Storage on Trucks Prior to Reclamation EPA-L	Point of Generation & Satellite Accumulation of Batteries at Remote Locations EPA-M		

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III. FREQUENTLY ASKED QUESTIONS (FAQs), EPA RCRA/SUPERFUND HOTLINE MONTHLY REPORTS

- Battery Management Activities in Containment Buildings, April 1998 at www.epa.gov/epaoswer/hotline/98report/apr98.txt
- Hazardous Waste Liquid-Containing Pumps and the Liquids in Landfills Prohibition, June 1996 at www.epa.gov/epaoswer/hotline/96report/june.txt
- Frequently Asked Questions on the Universal Waste Regulations, May 1996 at www.epa.gov/epaoswer/hotline/96report/may.txt
- Lead-Acid Batteries and Universal Waste, December 1995 www.epa.gov/epaoswer/hotline/95report/12_95mhr.txt
- Spent Lead-Acid Batteries and Counting Requirements, June 1995 at www.epa.gov/epaoswer/hotline/95report/06_95mhr.txt
- Regeneration Versus Reclamation for Spent Lead-Acid Batteries, November 1994 at www.epa.gov/epaoswer/hotline/94report/11_94.txt
- Ni/Cd Batteries as Scrap Metal when Recycled, May 1990 at yosemite.epa.gov/OSW/rcra.nsf/Documents/8164ACFA9D112136852565DA006F0725
- Battery Regeneration, September 1985 at yosemite.epa.gov/osw/rcra.nsf/Documents/848260F6346F3443852565DA006F09CE